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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/500,706 02/09/00 GANAPATHI

S 61450

EXAMINER

MM91/0620

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ART UNIT

PAPER NUMBER

2855

DATE MAILED:

06/20/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/500,706

Applicant(s)
Ganapathi

Examiner
Octavia Davis

Art Unit
2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 4
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

Serial Number: 09/500, 706

Art Unit: 2855

6/13/01

DETAILED ACTION

Claim Objections

Claims 6, 7, 18, 23, 27, 38, 39, 40, 41 and 55 are objected to because of the following informalities: In claims 6, 7, 23 and 39, insert periods after the claim number. In claims 7, 27, 40 and 55, insert periods after each sentence. In claims 18 and 38, line 3, delete “ for ”. In claim 41, line 4, insert an “ a ” after “ including ”. Appropriate corrections are required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 - 61 are rejected under 35 U.S.C. 112, 2nd paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

The following lack antecedent basis: In CLS 1 and 21, line 8, “ the resistance ”.

In CLS 7 and 27, line 1, “ the width ”. In CLS 17 and 37, line 1, “ the thickness ”. In CL 41, lines 1 and 2, “ the magnetization ” and “ the device ”.

Claims 42 - 46 are improper method step claims. These claims do not further limit the method.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 - 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gurney et al (8377) in view of Gurney et al (6617) and Smith. Gurney et al (8377) disclose a method and apparatus capable of sensing pressure comprising the steps of providing a sensing device with a sensor including a plurality of layers, the plurality of layers comprising a non-magnetic conducting layer 79 disposed between a magneto resistive layer 77, the magneto resistive layer having a non-zero magnetostriction such that the resistance of the magneto resistive layer will change upon the application of pressure causing the magneto resistive layer to change and

thereby result in a change in resistance, the sensor also including a ferromagnetic biasing layer 81, the non-magnetic conducting layer 79 disposed on the ferromagnetic biasing layer 81 and the magneto resistive layer 77, and the sensor being disposed on a support structure and a substrate 61, the support structure being smaller than the substrate (See Cols. 5 and 6, lines 40 - 65 and 1 - 43) (cls 1, 9, 18, 21, 29, 38, 41, 46, 47 and 56), the nonmagnetic conducting layer including Tantalum (cls 11 and 31), the biasing layer including one of an alloy of NiFeCr and a laminated layer of CoTaZr and NiFeCr (See Col. 7, lines 10 - 24) (cls 12, 14, 32 and 34), the magneto resistive layer including a nickel alloy (cls 13, 15, 16, 33, 35 and 36), the thickness of each of the ferromagnetic biasing layer, the nonmagnetic conducting layer and the magneto resistive layer being within a specific range (See Col. 6, lines 20 - 67) (cls 17 and 37), an underlayer 82, Ta being disposed between the support structure and the ferromagnetic biasing layer (cls 19 and 39) and the underlayer comprised of Tantalum (cls 20 and 40) **but does not disclose** the sensing device including a plurality of sensors that are formed in a two dimensional array and operate as the one sensor so that each sensor detects the pressure of an area associated with that sensor (cls 42, 45 and 56), sensing an initial and a reference resistance, immediately prior to or immediately following, of the device when the ferromagnetic layers are in the biased state without the application of pressure (cl 43), determining the pressure applied to the sensing device using both the initial resistance and the sensed resistance in order to

minimize the influence of external conditions on the determined pressure (cl 44), the support structure being a membrane and deformable beam formed of semiconductor layers (cls 2, 3, 8, 22, 23, 28, 50, 51 and 59), the deformable beam being formed of a conductor (cls 4, 24 and 52), the beam having a length between 2 microns to several hundred microns (cls 5, 10, 25 and 53), the beam having a thickness ranging from 0.1 microns to 20 microns (cls 6, 26 and 54), the beam having a width ranging from 1 micron to several microns (cls 7, 27 and 55) and each sensor having a length of 1 micron to several hundred microns (cl 30). However, Gurney et al (6617) disclose an atomic force microscope system comprising a sensing device 60 including a plurality of sensors that are formed in a two dimensional array and operate as the one sensor so that each sensor detects the pressure of an area associated with that sensor (cls 42, 45 and 56), sensing an initial and a reference resistance 25, immediately prior to or immediately following, of the device when ferromagnetic layers 112 - 114, 116 are in a biased state without the application of pressure (See Col. 5, lines 36 - 64) (cl 43), determining the pressure applied to the sensing device using both the initial resistance and the sensed resistance in order to minimize the influence of external conditions on the determined pressure (See Col. 6, lines 11 - 24) (cl 44) and means for forming and patterning a support structure 23 which constitutes a membrane and a microfabricated deformable beam (See Col. 6, lines 39 - 48) (cls 2 - 8, 10, 22 - 28, 50 - 55 and 59). Smith discloses a GMR-DMR sensor structure 10 comprising a


substrate 12, a plurality of ferromagnetic layers 16, 18 ferromagnetically coupled and the sensor structure having a length of 1 to several hundred microns (See Col. 6, lines 46 - 62) (cl 30).

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Gurney et al (8377) according to the teachings of Gurney et al (6617) and Smith for the purposes of, providing an improved magneto resistive sensor wherein the ferromagnetic sensing layer is a laminated layer of two ferromagnetic films and providing a GMR-DMR multilayer that achieves the functionally equivalent high density reproduction advantages intrinsic to the conventional DMR reproduce head designs.

Any inquiry concerning this communication should be directed to Examiner Octavia Davis at telephone number (703) 306 - 5896.

OD

OD/2855


Benjamin R. Fuller
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